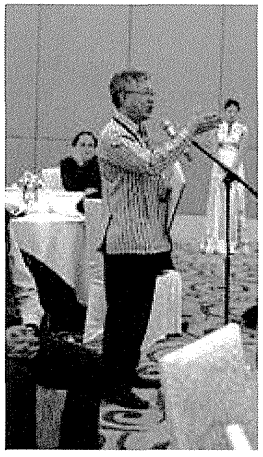
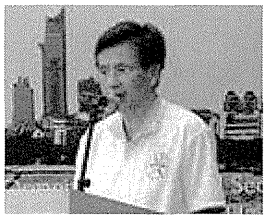
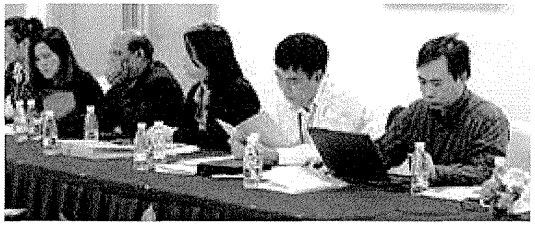
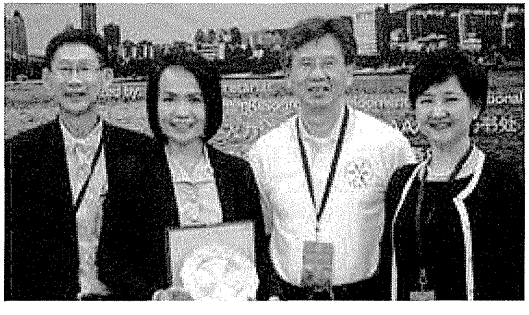
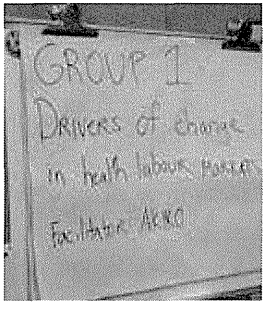
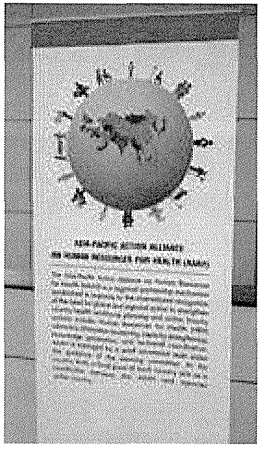








GROUP 1
Drivers of change
in health labour





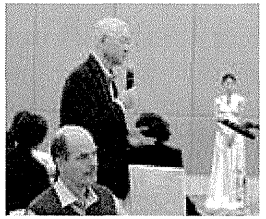
AAAH HRH Award

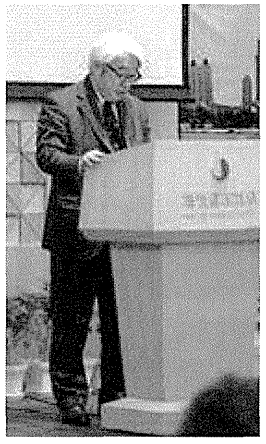


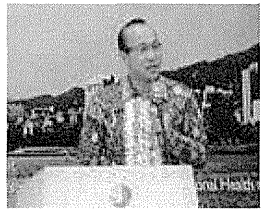






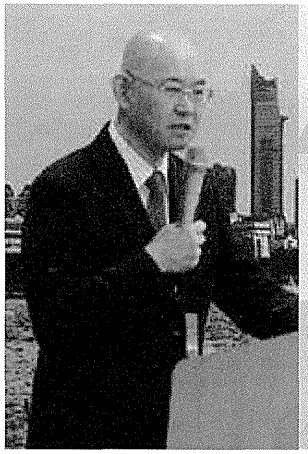







"...No health without health workers"

Dr. Gulin Gedik from Recife Conference



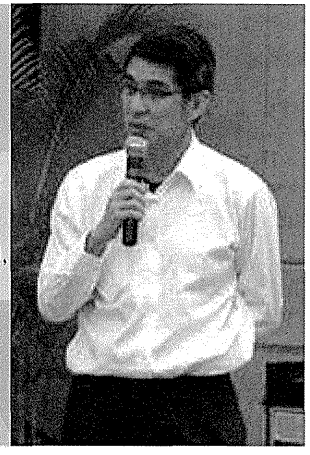
....Locally available evidence
is good enough... (to move the society),
Peter Piot said we cannot wait
for RCT for Ebola control,
Immediate actions must be installed

Professor Masamine Jimba (8th AAAH)

.....He quoted
"Rome wasn't built in a day"

Dr. Viroj Tangcharoensathien (8th AAAH)

Don't wait for evidence,
<20% of policy decisions are based
on scientific evidence,
>80% relies on experiential evidence and leadership
(when political window of opportunities open),
it is as important as
or even more than scientific evidences



Dr. Suwit Wibulpolprasert (8th AAAH)

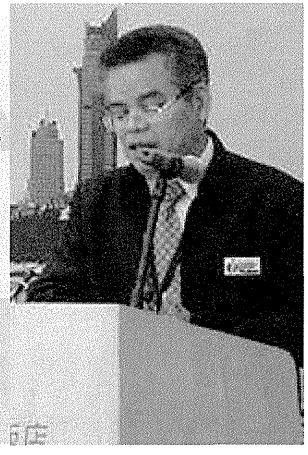
"If you want to go fast,
go alone and close your mind
If you want to go far,
open your mind and go together"

Dr. Tomohiko Sugishita (8th AAAH)

"

Success of evidence informed policy
relies on country capacities and commitment,
while AAAH is a platform for learning and sharing.
....Concept, practice, governance and evolution
from talk-to task-based forum are
good lessons for productive networks.
As an action network,
AAAH will keep moving forwards

"



Dr. Weerasak Putthasri (8th AAAH)

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研究成果の刊行に関する一覧表（平成26年度）

学術雑誌

発表者 氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Masamine Jimba	Power of community health in implementing the universal health insurance system in Japan.	Japan Medical Association Japan	57(1)	10-4	2014
Moe Miyaguchi, Junko Yasuoka, Amod Kumar Poudyal, Ram Chandra Silwal and Masamine Jimba	Female community health volunteers service utilization for childhood illness- improving quality of health services only is not enough: across-sectional study in mid-western region, Nepal.	BMC Health Service Research	14(1)	383	2014
Moe Moe Thandar, Myat Phone Kyaw, Masamine Jimba and Junko Yasuoka	Caregivers' treatment-seeking behaviour for children under age five in malaria-endemic areas of rural Myanmar: a cross-sectional study.	Malar Journal	14(1)	1	2015

書籍

著者氏名	論文タイトル名	書籍全体の編集者名	書籍名	出版社名	出版地	出版年	ページ
Bruno F. Sunguya, David P. Urassa, Junko Yasuoka and Masamine Jimba	The role of nutrition training for health workers in addressing poor feeding practices and undernutrition among HIV-positive children.		Health of HIV Infected people: food, nutrition, and lifestyle without antiretroviral drugs	Academic Press	London	2015	113-130

学会発表等　（神馬征峰）

日付	内容	依頼者	備考
2014.7.29	Power of community health in implementing the universal health insurance system in Japan.	公益社団法人 日本医師会	2013-2014年 武見フェロー 帰国報告会
2014. 10.17~10.19	Overcoming Post-Universal Health Coverage Challenges.	アジア・太平洋地区公衆衛生大学院連合会議 (APACPH)	The 46th Asia-Pacific Academic Consortium for Public Health: APACPH
2014.10.30	Reforming Professional Education for Successful Outcomes under Limited Evidence.	アジア太平洋公衆衛生大学院連合会議 (APACPH)	Asia-Pacific Action Alliance on Human Resources for Health (AAAH), Plenary Session III: Reforming of health Professional education to produce competent health personnel related to population health needs and health systems; Lead speaker
2014.10.30	AAAH for the Capacity Building of HRH Research and Policy Making.	アジア太平洋保健人材連盟 (AAAH)	Asia-Pacific Action Alliance on Human Resources for Health (AAAH), Plenary Session IV: Inter-sessional activities to generate policy-relevant research in HRH.
2015.4.25	Strengthening Interprofessional Education: Science and/or Art?	群馬大学	日本インタープロフェッショナル教育機関ネットワーク(JIPWEN)シンポジウム

学会発表等（安岡潤子）

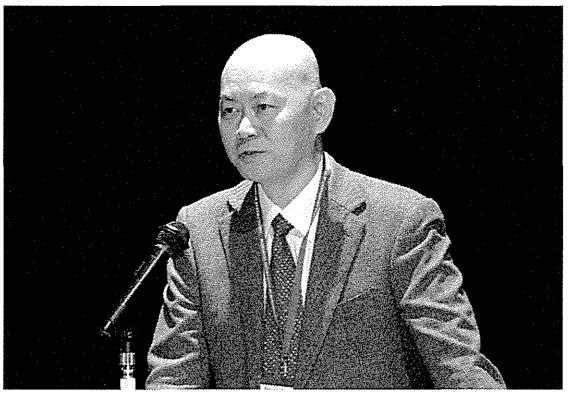
日付	内容	依頼者	備考
2014. 9.26	Global health research and education through community-based malaria project in Cambodia	環太平洋大学協会(APRU)	2014 APRU Global Health Program Workshop

Session 1

Power of Community Health in Implementing the Universal Health Insurance System in Japan*1

JMAJ 57(1): 10-14, 2014

Masamine JIMBA[1]
(Takemi Fellow 2001-02)



I was in Boston as a Takemi Fellow from 2001 to 2002. Before that, I worked in the Gaza Strip and West Bank for two years and Nepal for five years during the maoist conflict, and so I expected that I would finally be able to do some solid studying in a safe place. However, the 9.11 attack occurred a week after I arrived in Boston. Although danger seems to follow me, I was able to spend a very meaningful year there.

The topic of my talk today is universal health coverage. These days it is one of the hottest topics in global health and it is sometimes abbreviated UHC. The out-of-pocket (OOP) expenditure for health care is considered as a key indicator for UHC and it is extremely high in many developing countries. Reportedly, 150 million people suffer from financial catastrophes and 100 million are pushed into poverty due to OOP payments every year. In some of the South and South East Asian countries, on average, patients were required to pay 35% of the total health care expenditure in 2010. They are currently aiming to reduce this to 15 to 20%. Health care and poverty are closely related and UHC is an extremely important measure to fight poverty.

High healthcare costs can indeed lead to poverty, and this was also a major issue in Japan about 50 years ago. According to the Ministry of Health and Welfare's annual health report, 1.77 million people were on welfare in 1956 and disease or injury was its cause in 64.5% of those welfare cases. In those days, medical care was also considered an extremely expensive luxury.

Globally, UHC is defined as follows: All people receiving quality health services that meet their needs without exposing them to financial hardship. This is a movement aiming at covering all people in every country with UHC systems and ensuring that paying health costs does not cause economic catastrophes.

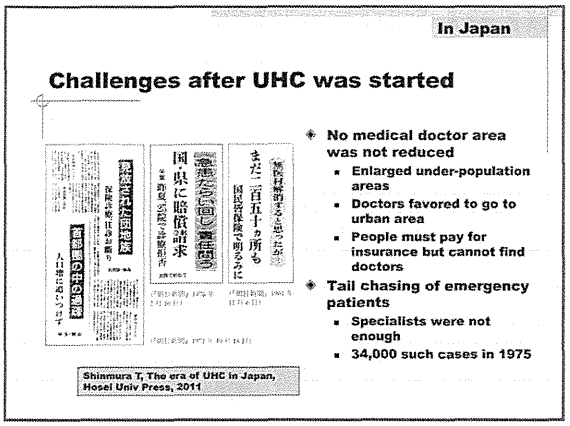
Although UHC has been in the spotlight recently, its concept is by no means a new development. Let's look at WHO's movements since the WHO charter of 1948. Notably, the "Health for All" slogan advocated after the Declaration of Alma-Ata in 1978 has continued since then and come into the spotlight now as the realization of UHC. In Japan, a universal health insurance system was already established in 1961, and its successful outcomes, such as equity and reduction of medical costs, have been taken up in different professional journals.

Japan's universal health insurance system was even taken up in a 2011 edition of the Lancet as one of successful UHC cases in the world. Looking back at the chronology of UHC in Japan from 1922 to 1961, however, progress has been made by trials and errors than a series of

*1 This article is a revised transcript of the presentation delivered by the author at the Takemi Program 30th Anniversary Symposium, which was held at the JMA Auditorium, Tokyo, on November 23, 2013.
Due to space limitations, not all of the slides shown in the original presentation appear in this article.

1 Professor, Department of Community and Global Health, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan (mjimba@m.u-tokyo.ac.jp). Chair of the JMA Global Health Committee.

(Slide 1)



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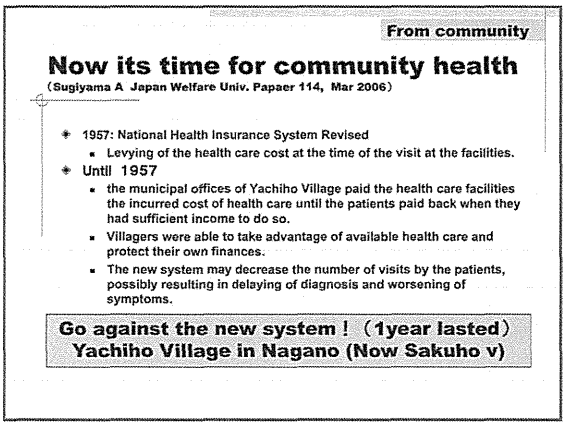


evidence-based policies. Interestingly, when we focus this period of approximately 40 years from 1922, we can see that the phrase "global health" hardly appears in the scientific literature. It was not completely absent, but it certainly was not used very frequently. Also, it was not the case that Japan was initially thinking about its contribution to the rest of world when UHC was developed in Japan; it worked single-mindedly to create the system for the Japanese citizens. Yet today it is attracting attention as having global significance. Yesterday it was suggested that community health and global health are two sides of the same coin. The tireless journey taken locally for the Japanese people is globally applicable now, and the prime example is Japan's universal health insurance system.

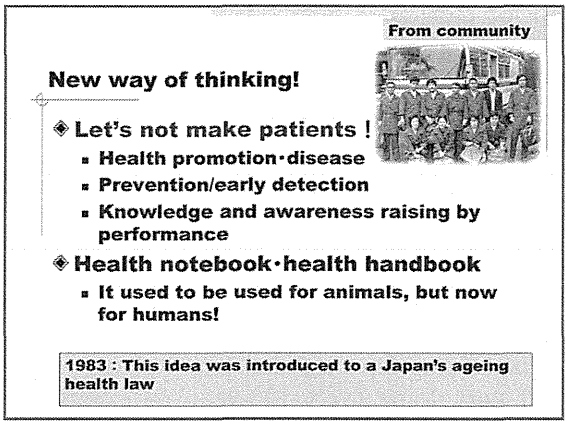
As UHC began to spread within Japan, there were some undesirable findings. For example, some areas continued to have no medical doctor available, and tail chasing of emergency patients took place where specialist doctors were not available (**Slide 1**). This was because invisible problems became visible as the nationwide system was put into practice. Problems lurking in every corner came into sight as the system was developed and then put into practice. How should we tackle this? The introduction of the UHC was highly appreciated, but it was no easy matter to make it work. This situation is similar to the Takemi Program, which faced a variety of trials after it had started, and the same went for Japan's UHC.

To overcome such undesirable findings, the roles of community health should be more emphasized. Let me show you an example of community actions which took place during the process of establishing the UHC in rural Japan. In 1957, the UHC was still incomplete and a new system was about to start to increase fund for its implementation. The aim of this system was to make a national policy to collect the medical expense at the time of a visit to a medical facility.

However, Yachiho Village (now Sakuho Village) in Nagano Prefecture in central Japan strongly opposed this new policy. Before, the municipal office of the village used to pay medical cost to a medical facility on behalf of patients, who would then pay back the costs when they had sufficient cash to do so. This enabled villagers to go to medical institutions when necessary without worry. But, if the medical expense were to be collected at the time of visit, the municipal office would not be able to pay expenses on patients' behalf. In that case, villagers might not go to medical institutions unless they had an irreversibly serious illness. By having anxiety about such a possibility, Yachiho Village waged a yearlong opposition campaign (**Slide 2**).

However, resistance was not kept up long, and they were obliged to change their thinking (**Slide 3**). If, the villagers thought, the collection of the medical expense was too difficult at the time of a visit, then they would try to avoid people getting sick. Thus they launched a health promotion campaign. First of all, they introduced health handbooks and health registers. The idea of using health register was used based on their

(Slide 3)



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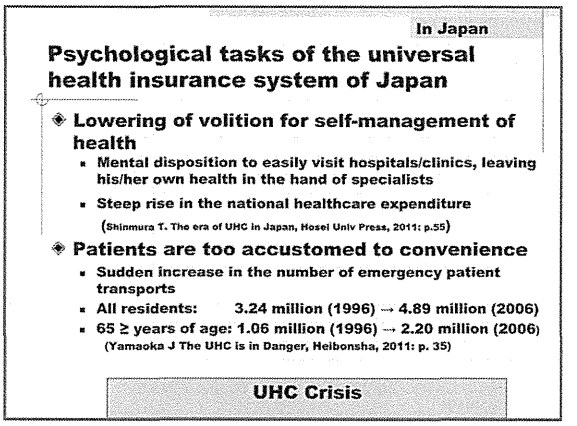


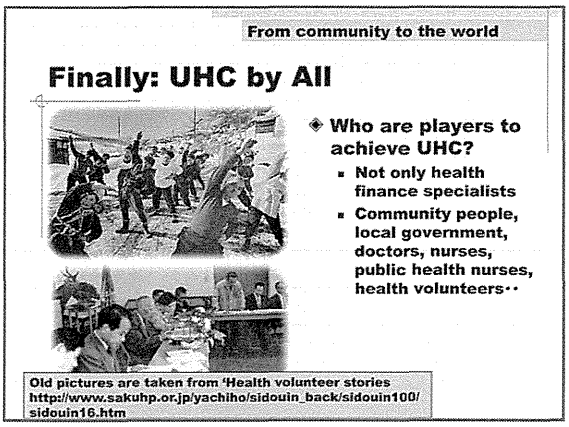
experience of using livestock registers. At that time the village had many livestock, and a good system had been developed for checking the health of livestock, since the death of farm animals meant financial problems. And so the idea was to apply these registers for people to avoid people getting sick. This concept is not limited to Japan. When I met a specialist fighting polio in western Africa I heard that there are ethnic minorities who were hesitant to receive vaccination; however, similar to Yachiho Village, the ethnic minorities were vaccinating and managing the health of their livestock. With this information in hand, the medical personnel could say, "If you vaccinate your animals, you should also vaccinate your children." With this argument, the vaccination program went well.

After these health promotion activities, Yachiho Village could drastically reduce its healthcare costs. Data show that the village saved 200,000 yen per senior citizen in healthcare costs, or 200 million yen for a population of 1,000, as the outcome of 50 years of effort. Their community health programs also had a major impact on national policy.

It was Saku Central Hospital that supported these efforts. I am sure that most of you know about Saku Central Hospital, I would like to emphasize the efforts they made through theater and movies. Such art-based approaches created a rapport with the people and were extremely beneficial in practicing community health activities. The inspiration for these efforts came from the ideas of Kenji Miyazawa, an early twentieth-century poet and modernist. According to Miyazawa, one of keys to successful cultural activities in a rural community is to perform drama as an actor. Inspired by these words, Dr. Shunichi Wakatsuki, director of Saku Central Hospital, started theatrical activities and movies. Such activities are not limited to Japan; similar efforts have been made in other countries such as the UK, Australia, and South Africa. The importance of the arts in community health is suggested in a book entitled *Arts Development in Community Health: A Social Tonic*. In this way, the efforts undertaken by Dr. Wakatsuki have been similarly implemented in the world, not just in Japan.

Now let's turn our attention to the present. Japan's UHC has been maintained comparatively well thus far. Nevertheless, there are problems, such as the aging of the population. Figuring out how to resolve these problems has become a major issue. Several researchers have pointed out the psychological challenges brought about by this system. They wonder whether the spread of this system has caused a decline in awareness of the need to manage one's own health by oneself. People have come to perceive that they can leave their health issues to specialists, since health services are easily accessible. And the researchers question whether such an attitude has caused the rapid rise in the national healthcare expenditure. For example, ambulance transport has increased enormously as more and more patients become too accustomed to convenience. The number of patients who used an ambulance increased from 3.24 million in 1996 to 4.89 million in 2006. Meanwhile, patients

(Slide 5)



aged 65 and older more than doubled, from 1.06 million to 2.20 million. Thus, the reasoning goes, soaring healthcare costs are associated with the patients who are overly accustomed to convenience. And so the challenge now is to figure out what can be done in community health to counter this trend (**Slide 4**).

Put another way: a community research specialist, John L. Mcknight, said this. "As the power of a system, such as Japan's UHC, grows, the power of community declines. As control magnifies, consent fades. As standardization is implemented, creativity disappears. As consumers and clients multiply, citizens lose power. To build a healthy society, we need two tools: a system and a community." It is important to strengthen systems. But, unless communities become just as strong, a balanced society will not be created. A book has come out in Japan that addresses those kinds of questions. An English translation of the title would be something like *Toward a Society with Community Health*. It is a very useful book, and it introduces many examples of community health activities in Japan.

For example, in Kochi Prefecture there is something called "lively 100-year-old exercise." The other day I went to Ghana, where people were doing *yosakoi dance*, an energetic form of traditional Japanese dancing. Perhaps people will start doing lively 100-year-old exercise in Ghana, Thailand, and other places to get healthy. It really is a great community health action. This is something worth disseminating to the rest of the world. In that sense, it is becoming increasingly certain that community health and global health are two sides of the same coin nowadays.

Systems are important. But, it is the power of everyone together that brings a system into fruition. At the beginning of my talk, I mentioned the phrase "Health for All." Now, the important message is not "Universal Health Coverage for All" but rather "Universal Health Coverage by All" (**Slide 5**). Community health has a very big role to play toward that end. The members of prefectural medical associations involved in the realization of community health will make a big mark in the future. I hope that you will all do your best with the thought that someday what you are doing now will be accepted throughout the world.

Comment

Akira AKAGAMI[2]

Dr. Jimba's talk noted the need for both top-down and bottom-up policy approaches when establishing a community health and medical system in developing countries. He used the example of initiatives by Yachiho Village in Nagano Prefecture during the creation of Japan's universal health insurance system to highlight the importance of the role of bottom-up approaches. I felt that the talk was very instructive, considering the various problems faced by the current universal health insurance system.

[2] Tokyo Medical Association, Tokyo, Japan. Member of the JMA Global Health Committee.

Within the social milieu in Japan, which has a rapidly graying population with a declining birth rate, an important role of community health will be to establish comprehensive community-care systems appropriate to the special characteristics of each community.

I would like to take this opportunity to introduce initiatives of local medical associations in regards to 1) emergency geriatric care and 2) 24-hour at-home care systems.

1) Emergency geriatric care: I live in the Hachioji City in Tokyo. Emergency transport of elderly patients has been increasing with the aging of the population. Dr. Jimba mentioned that patients are sometimes refused because of lack of space at medical institutions, and it is becoming increasingly difficult to find hospitals to transport patients to. In Hachioji, the Hachioji Geriatric Emergency Medical System Network was launched and an Emergency Medical Information Form (Fig. 1) created as a measure to establish a reliable and safe emergency transport system to handle the emergency requests of senior citizens. The participating institutions are emergency hospitals, psychiatric hospitals, geriatric facilities, nursing care companies, the fire department, Hachioji City, and the medical association. The special feature of this Emergency Medical Information Form is that it includes, in addition to the general medical information, check boxes for items that the patient would like to communicate to the doctor just in case, such as: "I want lifesaving and life-support measures taken as much as possible," "I want measures taken if they will ease pain," and "I want to be watched over in as natural a condition as possible." This form is for senior citizens aged 65 and older, and I think that it is important for older persons to talk in advance with their families about the kind of end-of-life care they would like to have.

2) 24-hour at-home care systems: Last year the Tokyo Metropolitan Government commissioned the Tokyo Medical Association to create an at-home mutual assistance system. The Hachioji Medical Association took over this project and is studying the establishment of an at-home care system to assist member physicians.

With respect to at-home care, many physicians tend to be hesitant about home visit care for reasons such as they are too busy with outpatients to do home visit care or that it is difficult to respond on weekends, at night, or while traveling. So, we are considering three-way cooperation among primary care physicians, visiting nursing stations, and enhanced at-home assistance clinics.

The first step is to set up visits from a 24-hour visiting nursing station to the patient who will receive at-home care. This puts medical information such as visit instructions and visit nursing records in the station. The second step (Fig. 3) is to have a system for handling emergency house call requests at times when the patient's primary care doctor is not working, such as on days off, at night, or while traveling. As the first call, the visiting nursing station contacts the primary care doctor. If the primary care doctor cannot respond, a second call is made, this time to an enhanced at-home assistance clinic (on a rotating system), and the assistance clinic on duty will respond. The progress is then reported to the primary care doctor the following day. Future challenges will be to deepen cooperation between the government and logistical support hospitals, to develop safe IT for sharing information, and to conduct publicity so that more doctors can participate in at-home care.

Lastly, Figure 4 shows the medical association perspective for establishing comprehensive community-care systems. President Nonaka of the Tokyo Medical Association prepared this figure. The Tokyo Medical Association has expressed its active support for the creation of a medical provision system and comprehensive community care through the cooperation of local medical associations and multi-occupation organizations, for the benefit of people who live in the community. The elevation of bottom-up policies is critical for medical initiatives from the perspective of residents, from local medical associations to the Tokyo Medical Association and then up to the Japan Medical Association: the local medical associations can play such important roles.

Miyaguchi et al. BMC Health Services Research 2014, 14:383
http://www.biomedcentral.com/1472-6963/14/383

BMC
Health Services Research

RESEARCH ARTICLE Open Access

Female community health volunteers service utilization for childhood illness- improving quality of health services only is not enough: a cross-sectional study in mid-western region, Nepal

Moe Miyaguchi[1†], Junko Yasuoka[1*†], Amod Kumar Poudyal[2†], Ram Chandra Silwal[3†] and Masamine Jimba[1†]

Abstract

Background: Female Community Health Volunteers (FCHVs) are considered service providers for major health problems at the community level in Nepal. However, few studies have been conducted about the roles of FCHVs from the users' perspective. This study sought to examine the current status of FCHV service utilization and identify the determinants of caregivers' utilization of FCHVs' health services in the mid-western region of Nepal.

Methods: This cross-sectional study targeted 446 caregivers of children under five years of age and whose children had ever fallen ill in the study village development committees (VDCs) of three districts of Nepal. Caregivers were asked about their usual health practices for childhood illness, health service utilization for childhood illness, children's health condition, satisfaction with health services, and socio-demographic status. Descriptive statistics and multiple logistic regression were used for analysis.

Results: Among 446 caregivers, 66.8% had never sought care from FCHVs for their children's illnesses in their lifetime, and more than 50% of them were unaware of FCHVs' services for acute respiratory infection and diarrhea. Among 316 caregivers whose child had an illness during the last seven months, 92.3% of them (n = 293) did not take their child to FCHVs. The main reasons were the lack of medicine available from them and their incompetency in providing care. Among the 446 caregivers, those who participated in a mothers' group (n = 82) were more likely to use FCHVs' services in their lifetime (AOR = 3.23, 95% CI =1.81-5.76).

Conclusions: Caregivers can gain benefit by using FCHV's health services, but a majority of the caregivers did not seek care from FCHVs due to its limited quality. Raising caregivers' awareness on FCHV is equally important at community level.

Keywords: Child health services, Health care seeking behavior, Female community health workers, Nepal

Background

Child mortality still remains high in developing countries. In 2011, 6.9 million children died in the world, and an estimated 83% of under-five deaths occurred in Sub-Saharan Africa and Southern Asia [1]. Acute respiratory infection (ARI) and acute diarrheal disease (ADD) are the major killers of children under five, and both are preventable and treatable by various existing interventions including feeding practices, oral rehydration salts (ORS) and antibiotics [1,2].

To improve treatment, a well-trained health workforce plays a key role, but the lack of such a trained health workforce has been one of the main challenges in developing countries [3]. To tackle this problem, Community Health Workers (CHWs) have been introduced into resource-limited, rural areas [4-6]. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) have issued a policy statement to promote pneumonia and diarrhea management by CHWs [7,8].

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Among several targeted countries, several CHW interventions were successfully carried out in hard-to-reach populations in developing countries [5,9].

Nepal is one of the countries most well positioned to achieve Millennium Development Goal 4. Over the past two decades, the country's under-five child mortality rate has been reduced by 65%, from 158 in 1990 to 54 in 2010, a notably low rate compared to other Asian developing countries [1,10]. To achieve this, Nepal has implemented community-based maternal and child health programs, such as immunization and micronutrient interventions, through trained Female Community Health Volunteers (FCHVs) [9,11].

In Nepal, nearly 50,000 FCHVs have been mobilized for prevention, diagnosis, and treatment services at the community level [12,13]. FCHVs are locally recruited women, ready to work voluntarily and usually selected by mothers' group. After attending an 18-day training, they offer community-based health and family planning services, including safer motherhood, newborn care, immunization, nutrition counseling, communicable and epidemic disease control, and health education [12]. FCHVs also diagnose ARI and treat children with cotrimoxazole; identify ADD and treat with ORS and zinc as part of the community-based integrated management of childhood illness (CB-IMCI) program, which has reached and provided nationwide coverage since 2009 [12-14].

Several studies have confirmed the success of FCHV interventions toward improving child health and reducing child mortality in Nepal. Trained FCHVs can offer health services of almost equivalent quality to those provided by facility-based health workers; for example, they can correctly diagnose, treat, and recognize danger signs of common childhood illnesses [15]. ARI-specific mortality was reduced with community-based treatment of childhood pneumonia provided by CHWs including FCHVs in Jumla district, a remote mountainous area of Nepal [16]. Another study showed that community-based IMCI programs provided by FCHVs increased ARI case detection from 1,290,632 in 2004 to 1,498,356 in 2006. As for diarrhea, the number of severe diarrhea episodes was significantly lower in districts with community-based IMCI conducted by FCHVs than in districts without the program [17]. From 2011 to 2012, FCHVs treated 55% of ARI and 55% of diarrheal cases [18].

Despite such reported effectiveness of FCHVs, their child health services have been limited. The 2011 Nepal Demographic and Health Survey (DHS) reported that, many children's caregivers seek treatment at health facilities, while only 3% went to FCHVs [10]. Utilization of FCHVs' services was higher in the Nepal Family Health Program survey, which was conducted mainly in rural areas, but still only 14% of caregivers sought care from FCHVs [19]. In rural areas, most people visit traditional healers first when they fall ill [20], especially among those of low socio-economic status [21]. For childhood illness, self-medication or traditional medicine are commonly pursued treatment options, but most research has focused on health facility utilization. Also, little research has addressed how other health services, such as FCHVs and traditional healers, are utilized.

Caregivers' health care-seeking behavior is an important factor influencing childhood illness management. In developing countries, several studies have reported a variety of determinants of health care-seeking behavior for childhood illness- including caregiver's education level, economic status, age, and ethnicity; distance to the health facility; child's age; child's nutritional status; caregiver's recognition of illness severity; caregiver's prior participation in health education; caregiver's knowing a medical doctor; and health care quality issues [22-26]. In Nepal, health care-seeking behaviors for childhood illnesses are known to be associated with the number of symptoms, caregiver's level of education, family income [27], child's gender [28], and cost of health care [29]. CHW activities and education programs, meanwhile, have improved caregivers' care-seeking behaviors [30]. Providing antenatal health education packages through FCHVs has also shown positive results in increasing caregivers' health care-seeking behaviors, service utilization, and recognition of danger signs [31]. Such findings suggest that FCHV programs can be effective for improving health care-seeking behaviors for childhood illnesses.

Yet few studies have focused on current status and the determinants of caregivers' FCHV service utilization in Nepal. Thus, the objectives of this study were 1) to examine current status of FCHV service utilization, and 2) to identify the determinants of caregivers' utilization of FCHVs' services for their children's illnesses, in the mid-western region of Nepal, one of the most remote and economically depressed areas of the country.

Methods

This cross-sectional study was conducted in June 2012, in three Village Development Committees (VDCs, the smallest political unit in Nepal) of three different districts located in the mid-western hill region of Nepal: Bijayshwari VDC (Rukum district), Kalagaun VDC (Salyan district), and Jagatipur VDC (Jajarkot district). The three VDCs and districts were purposively selected for the study sites based on the following three characteristics: 1) rural mountainous areas with limited transportation, but accessible by car or plane; 2) high numbers of childhood illness cases reported in Bijayshwari VDC (the second highest cases in the Rukum district) and Jagatipur district (the third highest cases within Jajarkot VDC) in 2011; and 3) technical support was available from the Chaurjahari mission hospital, which is located at the boundary of the three VDCs.

Participants in this study were the primary caregivers of children under five years of age who had ever been ill by the time of data collection. Among those participants, we also asked recent health service utilization for the primary caregivers of children under five years of age who had been ill during the past seven months. Primary caregivers were excluded from the study if they were under the age of 18 years or had serious physical or mental disability.

Sample size was calculated based on an estimated rate of utilization of FCHVs' services for any childhood illness. The required sample size was calculated to be 240, to attain 80% power with alpha set at 0.05 for a two-tailed test. However, to counteract the effect of missing data, data were collected from 450 households.

A two-stage random sampling method was adopted. First, three wards from nine wards in each VDC were selected randomly. After selecting these wards, a name list was made of households with children under five years based on VDC name lists. Data collectors visited every household to verify which households had children under five years. From three wards of each VDC, 150 participants were randomly selected from the list. The number of participants from each ward was adjusted proportional to the total number of households therein because the number of households varied among wards. In Jagatipur VDC, however, the total household number in the selected wards was only 155, so we included every household in the study.

Data collection procedures

In total, 455 caregivers were selected for the survey. Among them, 451 caregivers agreed to participate in the survey, but five caregivers were excluded as their children had never been ill in their lifetime, resulting in 446 participants. Out of 446 participants, 316 had children who had fallen ill within the last 7 months. These 316 participants were analyzed for health service utilization, while a total of 446 participants were analyzed for FCHV service utilization.

Primary caregivers were interviewed for approximately 40 minutes using a structured questionnaire administered by trained interviewers in the Nepali language. To this end, VDC secretaries or FCHVs were asked to invite the primary caregivers of children under five years of age to public places such as schools, where interviewers then conducted face-to-face interviews.

If a primary caregiver had more than one child under five years of age, the caregiver was asked specifically about the child who had experienced an illness most recently. If no child had fallen ill within the seven months, the youngest child was designated as the focus of the interview questions.

Measurements

The questionnaire [Additional file 1] was adapted from the Nepal DHS questionnaire [10], IMCI Household Survey questionnaire [32], and Nepal Family Health Program survey questionnaires [19,33]. Items elicited information on health service utilization for childhood illness including utilization of FCHVs' services, knowledge of danger signs of childhood illness, usual health practices for childhood illness and socio-demographic characteristics.

Utilization of FCHVs' services

Caregivers were asked if they had visited an FCHV for treatment of their child's illness, especially for ARI or diarrhea [10]. If caregivers' answer were yes, they were categorized as "FCHVs' service user". In addition, caregivers were asked if they were aware of their ward's FCHVs' other services. FCHVs' services in our survey included providing health information through mothers' groups, advice to pregnant women, advice to postpartum mothers, advice regarding newborn care, condom and pill supplies, vitamin A for mother and child, and information on human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and other sexually transmitted infections (STIs) [19,33].

Usual health practices for childhood illness

Caregivers were asked about their usual health practices for their children's illnesses, including usual care seeking behavior, knowledge of danger signs, distance to health services, and cost of health services. Regarding the health costs, caregivers were asked if they could usually afford the costs of health care. For the distances, they were asked how long it takes to get from their house to each health service provider [32].

Health service utilization for childhood illness

Caregivers were asked regarding their actual practices in seeking health services in response to their children's illnesses. First, they were asked if their children fell ill after Dashain, one of the biggest festivals in Nepal, which took place seven months prior to the time of survey. If the answer was yes, they were also asked from where and whom they had sought treatment [32].

Socio-demographic characteristics

Socio-demographic characteristics were assessed using items from the DHS Household, Women's, and Men's Questionnaires, which include items on age, sex, education, ethnicity, religion, and family structure elements such as child's age and gender [10]. For ethnicity, participants were classified into three broad categories: upper caste (Brahmin/Chhetri/Jogi), indigenous ethnic groups (Janajati), and lower caste (Dalit).

Economic status of households was assessed by a weighted wealth index adopted from the 2011 Nepal DHS. The index incorporated information on roofing materials, ownership of agricultural land, livestock ownership, and

ownership of household assets including televisions, radios, clocks, fans, mobile phones, and dhiki (traditional wooden thresher) [8]. The variables were dichotomized and principal component analysis used as item weights that were summed to generate a wealth index. The total weighted wealth index score was subsequently divided into three categories: 40% "poor", 40% "middle", and 20% "rich" [34].

Data analysis

We compared socio-demographic characteristics along with knowledge-, health-, and FCHV-related variables between caregivers who had ever used FCHVs' services and those who never used FCHVs' services. Health service providers were categorized into three groups: health facilities, pharmacies, or FCHVs. Health facilities encompassed private hospitals, public hospitals, and health posts (or sub-health posts).

Chi-square or Fisher's exact test were applied to test the significant differences as appropriate. In addition, multiple logistic regression analysis was conducted to examine determinants of utilization of FCHVs' services for childhood illness. We controlled for economic status, number of family members, living with grandparents, caregivers' age, literate ability, caste, able to pay the cost of health care, autonomy for health service utilization, past experience for mothers' group participation, time to FCHV's residence, time to any health facilities, and satisfaction with FCHVs' services. Multicolliniearity was also checked by examining Spearman's correlation coefficient, and groups of correlated variables were defined using an absolute rho value = 0.5 or more.

For all procedures, statistical significance was set at p-value less than 0.05. Statistical analysis was performed using the Stata Special Edition 11.2 software package (StataCorp, College Station, Texas, USA).

Ethical considerations

Ethical approval was obtained from the Nepal Health Research Council (NHRC) and the Research Ethics Committee of the Graduate School of Medicine, the University of Tokyo. Primary caregivers participated voluntarily, and the confidentiality of their answers was maintained throughout the survey. Before administering the interview, informed consent was obtained in written form from all participants and with thumbprints from those who were illiterate.

Results

Differences in characteristics between FCHVs' services users and non-users

Out of 446 participants, almost all primary caregivers were mothers (94.2%), married (98.0%), and believed in the Hindu religion (97.3%). The mean numbers of their family members and children were 5.5 (standard deviation [SD] 1.8, 95% CI = 3-9) and 2.5 (SD 1.3, 95% CI = 1-7), respectively. Mean age of participants was 26.9 (SD 8.4, 95% CI = 18-65) years old; 61% had no formal schooling (N = 268) and 34.3% were illiterate (N = 153; Table 1). Among participants, 66.8% had never utilized FCHVs' services for their children's illnesses in their lifetime.

No significant difference was detected in socio-demographic characteristics between caregivers who had ever used FCHVs' services and those who had never used such services. However, FCHVs' services users' autonomy for decision making and affordability were significantly lower compared to non-users'. A significantly lower percentage of FCHVs' services users could decide to go to a health facility of their own independent accord (84.5% vs. 93.6%. $p = 0.002$). Also, they were less frequently able to cover health care costs compared to non-users (73.7% among FCHVs' services users vs. 92.6% among non-users, $p < 0.001$).

FCHVs' services users tended to spend less time to reach health services compared with non-users. Also relative to non-users, a significantly higher percentage of FCHVs' services users had used a private hospital (42.6% vs. 24.2%, $p < 0.001$), health post (29.7% vs. 21.5%, $p < 0.001$), or pharmacy (64.2% vs. 50.7%, $p = 0.026$) within one hour of their residences. Moreover, a higher percentage of FCHVs' services users lived within a 10-minute walk of an FCHV's residence compared to non-users (52.0% vs. 28.9%, $p < 0.001$).

About half of caregivers were not aware of FCHVs' services, and about one-third of caregivers received services from FCHVs (Table 2). The vitamin A program is an exception, with 90% of both users and non-users receiving vitamin A from FCHVs. FCHVs' services users exhibited a significantly higher percentage of FCHVs' services awareness, service utilization, and FCHVs' services satisfaction. Significantly higher percentage of FCHVs' services users were extremely satisfied with FCHVs' services compared to non-users (33.1% vs. 20.1%, $p < 0.001$).

Factors associated with utilization of FCHVs' services for childhood illness

Multiple logistic regression analysis was used to analyze factors associated with utilization of FCHVs' services (Table 3). Children who lived with grandparents were 52% less likely to have consulted FCHVs (95% CI = 0.27-0.86). Likewise, participants who were able to cover health care costs and who had autonomy in child health matters were 76% (95% CI = 0.12-0.46) and 58% (95% CI = 0.20-0.89) less likely, respectively, to have used the services of FCHVs. Furthermore, time taken to reach FCHV's residence was also negatively associated with FCHVs' services utilization. Participants who could reach FCHV's residence by walking

Table 1 Socio-demographic characteristics of respondents by FCHVs' services utilization (N = 446)

Variable	FCHVs' service user (n = 446)	%	Non-user (n = 298)	%	p-value
Number of family members†					
3 or 4	46	31.1	92	30.9	0.964
5 or more	102	68.9	206	69.1	
Number of children†					
1	39	26.4	85	28.5	0.890
2	39	26.4	76	25.5	
3	70	47.3	137	46.0	
Living with grandparents†					
Yes	47	31.8	123	41.3	0.051
Caregiver's age†					
< 25	143	48.0	68	46.0	0.684
25 or more	155	52.0	80	54.0	
School education level (no. of years)†					
Never attended	81	54.7	187	62.8	0.253
1-5	17	11.5	26	8.7	
6 or more	50	33.8	85	28.5	
Literacy†					
Literate	101	68.2	192	64.4	0.424
Illiterate	47	31.8	106	35.6	
Caste‡					
Upper caste	93	62.8	205	68.8	0.451
Janajati (indegious)	11	7.4	18	6.0	
Dalit	44	29.7	75	25.2	
Economic status†					
Poor	58	39.2	120	40.3	0.969
Middle	60	40.5	120	40.3	
Rich	30	20.3	58	19.5	
Decision maker about child health care					
Mother can decide†	125	84.5	279	93.6	**0.002****
Mother-in-law decides†	28	18.9	45	15.1	0.515
Able to pay costs for health care†					
Yes/Usually	109	73.7	276	92.6	**<0.001****
Have health facility within 1 hour walk†					
Yes	100	67.6	167	56.0	**0.019***
Time to FCHV's house†					
Less than 10 minutes	77	52.0	86	28.9	**<0.001****
11-30 minutes	49	33.1	118	39.6	
More than 30 minutes	22	14.9	94	31.5	
Have participated in mothers' group†	50	33.8	32	10.7	**<0.001****

†, Chi-square test; ‡, Fisher's exact test.
*, $p < 0.05$; **, $p < 0.01$.

within 11-30 minutes were 58% less likely (95% CI = 0.25-0.70) to have ever used FCHVs' services, and those who had to walk more than 30 minutes to reach FCHV's residence were 69% less likely (95% CI = 0.16-0.59) to have ever used FCHVs' services than those who could reach FCHV's residence within just 10 minutes. On the other

Table 2 Respondents' knowledge and utilization of FCHVs' services by FCHVs' services utilization (N = 446)

Variable	FCHVs' services user (n = 148)	%	Non-user (n = 298)	%	p-value
Knowledge about danger signs					
Fever†	135	91.2	281	94.3	0.222
Respiratory symptom†	116	78.4	202	67.8	**0.020***
Diarrheal symptom†	81	54.7	125	41.9	**0.011***
Knowledge about FCHV-provided services					
Vitamin A dispensing†	139	93.9	273	91.6	0.387
Iron tablet dispensing†	94	63.5	137	46.0	**<0.001****
Advice for pregnant woman†	100	67.6	125	42.0	**<0.001****
Advice for post-partum woman†	90	60.8	120	40.3	**<0.001****
Advice regarding newborn care†	82	55.4	107	35.9	**<0.001****
Treatment for diarrhea†	99	66.9	103	34.6	**<0.001****
Condom and pill dispensing†	75	50.7	124	41.6	0.070
Treatment for ARI†	58	39.2	92	30.8	0.080
Health information†	78	52.7	109	36.6	**0.001****
HIV/AIDS/STI information†	32	21.6	58	19.5	0.593
Services received from FCHV					
Vitamin A dispensing†	134	90.5	270	90.6	0.983
Iron tablet dispensing†	73	49.3	96	32.2	**<0.001****
Advice for pregnant woman†	59	39.9	13	4.4	**<0.001****
Advice for post-partum woman†	48	32.4	8	2.7	**<0.001****
Advice regarding newborn care†	53	35.8	9	3.0	**<0.001****
Condom and pill dispensing†	46	31.1	15	5.0	**<0.001****
Health information†	34	23.0	6	2.0	**<0.001****
HIV/AIDS/STI information†	23	15.5	6	2.0	**<0.001****
Satisfaction with FCHVs' services‡					
Extremely satisfied	49	33.1	60	20.1	**<0.001****
Generally satisfied	95	64.2	178	59.7	
Not satisfied	4	2.7	49	16.4	
Never met FCHV	0	0.0	11	3.7	
Things that need to be improved about FCHVs' services					
Medicine availability†	99	66.9	182	61.1	0.472
Service quality†	50	33.8	87	29.2	0.460
Interpersonal manners†	23	15.5	79	26.5	**0.005****
Access†	33	22.3	65	21.8	0.934
Health advice†	7	4.7	12	4.0	0.807

†, Chi-square test; ‡, Fisher's exact test.
*, $p < 0.05$; **, $p < 0.01$.

hand, participants who had ever participated in a mothers' group were 3.2 times more likely to have used FCHVs' services (95% CI = 1.81-5.76).

Caregivers' recent care seeking behaviors for childhood illness

Among 446 children, 316 experienced any illness during the past seven months. Their reported common symptoms were fever (82.3%), respiratory symptoms (73.7%), and diarrheal symptoms (41.8%). About one-third (32.3%) of caregivers recognized more than three of these symptoms, and 52.5% recognized their children's illnesses as severe.

Of those 316 children who had fallen ill in the last seven months, seven children did not visit any health service provider for treatment. Of the remaining 309 children who did seek treatment, 36 (11.7%) went to a health facility, 249 (80.6%) visited a pharmacy, and 23

Table 3 Association between selected socio-demographic factors and FCHVs' services utilization (N = 446)

Variable		AOR	95% CI	
			Lower	Upper
Economic status	Poor			
	Middle	1.19	0.68	2.06
	Rich	1.52	0.76	3.04
Number of family members	3 or 4			
	5 or more	1.38	0.77	2.47
Living with grandparents		**0.48***	**0.27**	**0.86**
Caregiver's age	25 or more			
	Less than 25	1.14	0.69	1.90
Literate		1.04	0.81	1.33
Caste	Upper caste			
	Dalit	1.27	0.73	2.19
	Janajati (indigenous)	1.19	0.48	2.91
Able to pay the cost of health care				
	Always/usually	**0.24****	**0.12**	**0.46**
Mother can decide to use health service				
	Yes	**0.42***	**0.20**	**0.89**
Have participated in mothers' group				
	Yes	**3.23****	**1.81**	**5.76**
Time to FCHV's residence	Less than 10 minutes			
	11-30 minutes	**0.42***	**0.25**	**0.70**
	More than 30 minutes	**0.31****	**0.16**	**0.59**
Have health facility within one hour's walk				
	Yes	1.63	0.99	2.68
Satisfaction with FCHVs' services	Generally satisfied/not satisfied			
	Extremely satisfied	1.55	0.93	2.57

*, $p < 0.05$; **, $p < 0.01$.

(7.4%) consulted a FCHV (Table 4). Seventy-four caregivers (23.4%) took their child to more than one health service provider, and 13 (4.1%) of them went to three providers. FCHVs, where consulted, were always consulted as the first-choice health service provider, and all FCHVs' services users also visited at least one other provider. Among caregivers who did not visit FCHVs for their children's illness during the last seven months (n = 293), two major reasons for not using FCHVs' services were "FCHVs often did not have medicine" (55.4%) and "FCHVs were not competent" (26.3%).

Discussion

This study showed that caregivers underutilized health services of FCHVs when their children suffered from illness in the study region. Major factors for the low utilization were lack of medicine with FCHV, perceived incompetency of FCHVs to provide services, and lack of awareness about FCHVs' services. The study also suggested that FCHVs' services were underutilized for other services in pregnancy, delivery, and postpartum and newborn care. However, caregivers' participation in mothers' groups was positively associated with their utilization of FCHVs' services.

Most caregivers did not visit FCHVs for their children's illness in the study site. Only 33% of caregivers had ever utilized FCHVs' services in their lifetime, and less than 10% of caregivers utilized FCHVs' services when their children had fallen ill during the past seven months. Underutilization of FCHVs' child health program was consistent with previous DHS data [8], but caregivers' awareness about FCHVs' services was much lower in this study than indicated in the previous national study [19]. Possible reasons for underutilization of FCHVs' services include caregivers' lack of awareness about FCHVs' services, lack of medicine with FCHVs, and easy access to pharmacies, from which caregivers could obtain a variety of medicines and advice.

Table 4 Health service utilization and satisfaction among caregivers of children who had fallen ill during the last 7 months (n = 316)

Variable	Health facility (n = 36)	%	Pharmacy (n = 249)	%	FCHV (n = 23)	%	p-value
Satisfaction with first-choice health service provider[†]							
Extremely satisfied	13	36.1	109	43.8	2	8.7	**0.008****
Generally satisfied	21	58.3	128	51.4	19	82.6	
Not satisfied	2	5.6	12	4.8	2	8.7	
Visited second-choice health service provider[†]							
Yes	19	54.8	31	14.2	23	100.0	**<0.001****
Reason for not visiting FCHV							
FCHV had no medicine[†]	18	50.0	155	62.3			0.160
FCHV was not competent[†]	17	47.2	64	25.7			**0.007****
Distance[†]	7	19.4	41	16.5			0.091
Did not know FCHV providing treatment[‡]	1	2.8	6	2.4			1.000
Benefit of getting treatment from FCHVs							
Saves time[†]	14	38.9	73	29.3	10	43.5	0.224
Able to acquire medicine[‡]	3	8.3	24	10.7	7	30.4	**0.015***
Free of cost[‡]	1	2.8	13	5.2	2	8.7	0.620

[†], Chi-square test; [‡], Fisher's exact test.
*, $p < 0.05$; **, $p < 0.01$.

Medicine availability was the main concern for caregivers. More than 50% of caregivers answered lack of medicine was the reason not to visit FCHVs. Also, about 65% of caregivers pointed out medicine availability should be improved in FCHVs' services. Although medicines were supplied to FCHVs through health posts, the supply was frequently delayed, which often led to shortages of medicines and other commodities at FCHVs [35-37]. If the district and VDC could procure and supply drugs promptly, FCHVs' services might be more widely utilized by caregivers in Nepal.

Many caregivers also claimed that FCHVs skill, knowledge, and attitude were not friendly to the client. Notably, 31.5% and 23.5% of caregivers raised FCHVs' inefficient service quality and FCHVs' lack of interpersonal manners as their primary concern, respectively. These were also claimed in the past as reasons for not using FCHVs' services [19]. The low satisfaction with FCHVs' services might have reflected caregivers' evaluations of FCHVs' insufficient capability. Providing additional and ongoing training for FCHVs might help to improve their competence, increase satisfaction with their health services among caregivers, and thus increase the utilization of their services. Previous research conducted in the eastern region of Nepal reported that FCHVs were able to acquire more knowledge and skills on several neonatal health services by attending additional training [16]. Another study conducted in the same region reported that caregivers were more likely to have visited FCHVs for child health consultations after attending education programs provided by FCHVs and other health personnel [38]. Such findings suggest that providing better and further training for FCHVs would improve their skills along with caregivers' care seeking behaviors.

Only the vitamin A program was well recognized among caregivers as one of the health services offered by FCHVs. While only about a third of caregivers had ever used FCHVs' services for their children's illnesses, 90% of caregivers had used the vitamin A program. The Nepal National Vitamin A Program (NVAP) was expanded nationwide in 2002 and is now widely recognized among caregivers because of the government's promotion efforts. This program can serve as a model for CB-IMCI program to increase awareness about their initiatives and promote utilization of FCHVs among caregivers. In the NVAP program, vitamin A capsules are provided in every six months to children aged 6-59 months through FCHVs [31,35,36]. NVAP uses mass media to promote the program and to have FCHVs deliver information to residents in their communities regarding time and location of the vitamin A distribution campaigns [37]. Such an active promotion of CB-IMCI programs could similarly encourage caregivers to utilize FCHVs' services for childhood illness management.

Caregivers' participation in mothers' groups had a strong impact on FCHVs' services utilization. Mothers' groups are comprised of local women of reproductive